

Fine Tuning Your Machine

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Have you ever thought about your body in comparison to a car? For example, if a car's tires are out of alignment it makes for a pretty rough ride at first, but what happens down the road? Different parts of the car start to compensate for this misalignment and supplementary parts have to work harder in order to keep the car moving. The car may run but much less efficiently. In the future this may be detrimental to the internal parts of your car. The same is true for the human body. The human body is a kinetic chain in which appropriate posture and alignment provides optimal structural and functional efficiency, favorable for peak performance. The kinetic chain has an incredible way of finding ways to compensate. Just like a car, if the body's functional demands are exceeded in a certain area of the body, then tissue failure occurs, leading to overuse injuries. A number of compensations are seen in the sport of gymnastics. Consequently, over time, many overuse injuries are prevalent especially in the lumbar spine.

Some injuries seen in sports, like the knee and lumbar spine, are derived from the flexibility and mobility in the hip and hip flexors. One common dysfunction seen is in the psoas musculature. The psoas musculature acts directly on the lumbar spine as a whole inserting to the inner thighs near the hips. As shown in illustration, it acts to flex and rotate the thigh, and flex and laterally bend the spine. This muscle is important in protecting the spine during hip flexion and rotational movements. Without flexibility and mobility through this muscle, the ability to flex the hip past 90 degrees is impossible without compensation. Compensation is especially seen in the split stretch. To complete this exercise many gymnasts lack flexibility and mobility through the psoas and compensate through arching the lumbar spine. What is commonly seen is a significant curve in the lower back otherwise called a lordotic curve. This is one prime example of compensation, while there are many others that may present itself throughout training for the sport of gymnastics. Therefore the flexibility and mobility of the psoas muscles should be a key part of a gymnast's training plan.

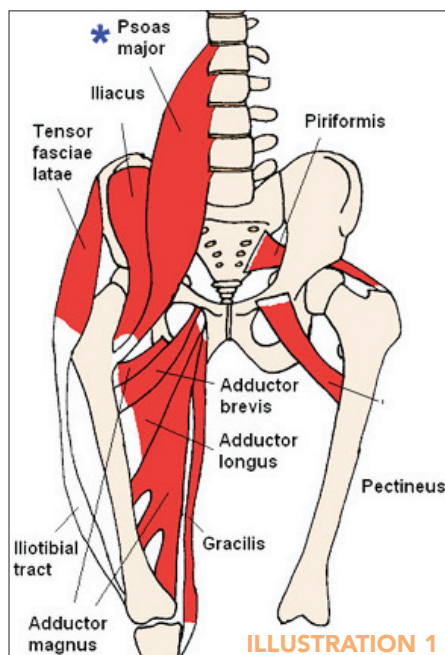
With this knowledge about the role of the psoas musculature, a general warm-up and cool down before and after practice is recommended to prevent injury to this muscle but especially to the surrounding anatomical areas. A number of exercises could play a pivotal part in preventing injuries.

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Stride with hip flexor (Fig. 1). To complete this exercise the gymnast stands with one hip and knee flexed by placing foot on a table/mat (height is approximately mid-thigh or higher). The opposite extremity remains extended with the foot flat on the floor. The torso and spine should be in a neutral and erect posture. The gymnast fires the glute to extend the hip, enough to feel a stretch in the front of the hip. Pay attention to extension through the hip and not the back. A lordotic curve will present itself if the gymnast is extending through the back.

Stride with Side Glide (Fig. 2). Figure 2 shows the gymnast standing with hip flexed and knee flexed with the foot placed on the table. Maximal stride position should be assumed. The opposite leg should be extended at the hip and knee. The torso and spine should be in neutral and erect posture. The gymnast leans towards the table maintaining erect spine, and pushes flexed hips toward the extended leg while reaching with the opposite arm. Keep hips parallel to the table.

Stride with Spinal Rotator (Fig. 3). Standing with the hip and knee flexed with the foot placed on the table. The opposite leg should be extended at the hip and knee. The torso and spine should be in neutral and erect posture. Lean toward the table maintaining an erect spine slightly bending the knee, and rotate spine toward flexed hip. Figure 3 the gymnast is shown completing this exercise. All exercises shown should be held for no more than 5 seconds and completed 5-10 times before beginning any other warm-ups for training or competition.



L to R: **Figure 1** Stride with hip flexor stretch | **Figure 2** Stride with Side Glide | **Figure 3** Stride with spinal rotation

Learning about the role of the psoas musculature in training and competition should motivate you to take 10 minutes of your time with this daily routine to better equip your body to prevent injuries seen at the lumbar level. ✖